CLAIM AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1   1. (Currently Amended) A method for determining the angular orientation of

2   an object comprising:

3   obtaining a plurality of images of the object;

4   assigning values to a plurality of positions in a polar plot using data

5   from the images, ~~wherein~~ the polar plot ~~has~~ <u>having</u> an origin <u>and data from</u>

6   <u>each image being assigned to a corresponding sector of the polar plot</u>; and

7   computing a centroid based on the assigned values wherein an angle of

8   the centroid with respect to the origin indicates the angular orientation of the

9   object.

1   2. (Original) The method according to claim 1, wherein said assigning

2   comprises identifying positions in the polar plot that are uniformly spaced,

3   identifying corresponding pixels in the image for the positions in the polar plot

4   and assigning luminance values for the pixels to the positions in the polar plot.

1   3. (Original) The method according to claim 2, wherein said assigning further

2   comprises interpolating for positions in the polar plot that are between pixels.

1   4. (Original) The method according to claim 1, wherein said assigning results

2   in a non-linear mapping of pixel position to polar position.

1   5. (Original) The method according to claim 1, further comprising

2   determining a width of the object by scanning each image.

1   6. (Original) The method according to claim 1, further comprising calibrating

2   cameras prior to obtaining the images from the cameras.

1   7. (Original) The method according to claim 6, wherein said calibrating

2   comprises obtaining images of a cylindrical object of uniform color.

1   8. (Original) The method according to claim 1, wherein the plurality of

2   images consists of four images taken by each of four cameras and wherein

3   said assigning includes assigning one of the images to each of four quadrants

4   of the polar plot.

1   9. (Original) The method according to claim 1, wherein the plurality of

2   images consists of three images taken by each of three cameras and wherein

3   said assigning includes assigning one of the images to each of three 120

4   degree intervals of the polar plot.

1   10. (Original) The method according to claim 1, the polar plot is divided into

2   sectors with an image of the plurality being obtained for each sector and with

3   all sectors of the polar plot being imaged.

1   11. (Original) The method according to claim 1, wherein said images are

2   obtained from near-infrared light from the object.

1   12. (Original) The method according to claim 1, further comprising

2   determining a location of the object in the field of view of each of a plurality

3   of cameras and when the object is not in the center of the field of view, said

4   assigning is corrected according to its distance from the center.

1   13. (Original) The method according to claim 1, wherein the object is a

2   person's head.

1   14. (Original) The method according to claim 13, further comprising

2   directing the person's voice at a remote location according to the angular

3   orientation of the person's head.

1   15. (Original) The method according to claim 13, further comprising
2   estimating a vertical position of the person's eyes and obtaining luminance
3   values of the images at or below the level of the person's eyes.

1   16. (Original) The method according to claim 15, wherein said estimating
2   comprises scanning the images to locate the top of the person's head and
3   measuring a distance down from the top of the person's head.

1   17. (Original) The method according to claim 15, wherein said estimating
2   comprises scaling the images.

1   18. (Original) The method according to claim 13, further comprising
2   performing a 180 degree correction of angular orientation of the person's
3   head.

1   19. (Original) The method according to claim 13, further comprising
2   displaying images of a remote location for the person.

1   20. (Original) The method according to claim 13, wherein said images are
2   formed by performing difference keying.

1   21. (Original) The method according to claim 20, wherein said images are
2   obtained from near-infrared light from the person's head.

1   22. (Original) The method according to claim 20, wherein said performing
2   difference keying includes subtracting a baseline image of an apparatus from
3   an image obtained with the person's head being located within the apparatus.

1   23. (Original) The method according to claim 22, wherein the apparatus
2   comprises projection screens that substantially surround the person.

1   24. (Currently Amended) The method according to claim 1, wherein the
2   ~~luminance~~ values assigned to the polar plot are <u>luminance values</u> obtained
3   from a band around the object that is one pixel wide.

1 25. (Original) The method according to claim 1, wherein the values assigned
2 to the polar plot are luminance values obtained from a band around the object
3 that is multiple pixels wide.

1 26. (Original) The method according to claim 25, wherein the luminance
2 values assigned to the polar plot represent a vertical average.

1 27. (Original) The method according to claim 25, wherein said assigning
2 further comprises performing bi-linear interpolation for positions in the polar
3 plot that are between pixels.

1 28. (Original) The method according to claim 1, wherein the values assigned
2 to the polar plot represent vertical luminance variance.

1 29. (Original) The method according to claim 1, wherein the values assigned
2 to the polar plot represent vertical frequency content.

1 30. (Currently Amended) A computer-readable medium encoded with
2 program storage device readable by a machine,tangibly embodying a program
3 of instructions executable by the a machine to perform method steps for
4 determining the angular orientation of an object, said method steps including
5 obtaining a plurality of images of the object, assigning values to a plurality of
6 positions in a polar plot using data from the images, wherein the polar plot has
7 having an origin and data from each image being assigned to a corresponding
8 sector of the polar plot, and computing a centroid based on the assigned values
9 wherein an angle of the centroid with respect to the origin indicates the
10 angular orientation of the object.

1 31. (Original) A system for determining the angular orientation of an object
2 comprising:
3   a plurality of cameras for obtaining that obtain a plurality of images of
4 the object; and

5   a computer ~~for assigning~~ that assigns values to a plurality of positions

6   in a polar plot using data from the images, ~~wherein~~ the polar plot ~~has~~ having

7   an origin and data from each image being assigned to a corresponding sector

8   of the polar plot, and the computer ~~for computing~~ computes a centroid based

9   on the assigned values wherein an angle of the centroid with respect to the

10   origin indicates the angular orientation of the object.

1   32. (New) A method for determining the angular orientation of an object

2   comprising:

3   obtaining a plurality of images of the object;

4   assigning values to a plurality of positions in a polar plot using data

5   from the images, the polar plot having an origin and being in a plane that is

6   independent of planes of the images; and

7   computing a centroid based on the assigned values wherein an angle of

8   the centroid with respect to the origin indicates the angular orientation of the

9   object.

1   33. (New) The method according to claim 32, wherein said assigning

2   comprises identifying positions in the polar plot that are uniformly spaced,

3   identifying corresponding pixels in the image for the positions in the polar plot

4   and assigning luminance values for the pixels to the positions in the polar plot.

1   34. (New) The method according to claim 32, wherein said assigning results

2   in a non-linear mapping of pixel position to polar position.

1   35. (New) The method according to claim 32, the polar plot is divided into

2   sectors with an image of the plurality being obtained for each sector and with

3   all sectors of the polar plot being imaged.

1   36. (New) The method according to claim 32, further comprising determining

2   a location of the object in the field of view of each of a plurality of cameras

3   and when the object is not in the center of the field of view, said assigning is

4   corrected according to its distance from the center.

1   37. (New) The method according to claim 32, wherein the object is a

2   person's head.

1   38. (New) The method according to claim 37, further comprising directing

2   the person's voice at a remote location according to the angular orientation of

3   the person's head.

1   39. (New) The method according to claim 32, wherein the values assigned to

2   the polar plot are luminance values obtained from a band around the object

3   that is one pixel wide.

1   40. (New) The method according to claim 32, wherein the values assigned to

2   the polar plot are luminance values obtained from a band around the object

3   that is multiple pixels wide.

1   41. (New) The method according to claim 32, wherein the values assigned to

2   the polar plot represent vertical luminance variance.